

## FINDING OF NO SIGNIFICANT IMPACT

### ALLEN FOSSIL PLANT UNITS 1, 2, AND 3 SELECTIVE CATALYTIC REDUCTION SYSTEMS FOR NITROGEN OXIDE CONTROL

#### The Proposed Action

TVA has prepared an environmental assessment of a proposal to install and operate selective catalytic reduction (SCR) systems at TVA's Allen Fossil Plant (ALF) Units 1, 2, and 3. Under this proposal TVA plans to install SCR systems for ALF Unit 3 in 2001, Unit 2 in 2002 and Unit 1 in 2003, respectively. The SCR systems would achieve as much as 90 percent NO<sub>x</sub> removal. This action is needed to meet Title I Clean Air Act requirements for ozone for which NO<sub>x</sub> is a precursor. The proposed SCR systems include a reactor housing and ductwork, catalyst, and an anhydrous ammonia system for unloading, storage, vaporization, air dilution, injection and control of ammonia. Additionally, in order to manage the portion of ammonia slip entering the fly ash waste stream, the existing West Ash Pond will be re-activated and expanded.

#### Background

The present flue gas treatment systems for environmental control for ALF units 1, 2, and 3 consist of the following train of components in order of treatment: a high efficiency electrostatic precipitator (ESP), induced draft fan and the unit stack. Also located in the flue gas stream is the air heater which preheats boiler combustion air and is located upstream of the ESP for each unit.

The SCR reactors would be physically installed upstream of the air heater in the gas path. The existing flue gas ductwork would be modified to accommodate the SCR reactors. The ESPs would continue to provide compliance with the particulate emission standard.

An ammonia system capable of serving SCRs on all three units would be installed and would consist of an area for truck parking and unloading; storage tanks; feed pumps; vaporizers and dilution air mixing units; and necessary controls. Additionally, a water fogging system activated both automatically and manually would be installed to limit the hazard from any accidental release of anhydrous ammonia from either the storage tanks or an unloading tank truck. The fogging system would combine water with anhydrous ammonia vapor to form aqueous ammonia liquid which would be contained within the chemical treatment pond capturing any spills from the storage tank area that receives runoff from the unloading area.

Currently, both fly and bottom ash are sluiced to the East Ash Pond which discharges into McKellar Lake. Ammonia slip from the SCRs could result in ammonia levels of concern in the East Ash Pond discharge into McKellar Lake or the Horn Lake Cutoff. To eliminate the potential for water quality impacts to McKellar Lake or the Mississippi River, the currently inactive West Ash Pond would be re-activated to accept fly ash. The West Ash Pond will be expanded (by approximately 700 by 1100 feet) and configured to discharge to the condenser cooling water discharge conduit or canal which empties its much higher volume of flow into the Mississippi River.

## Alternatives

TVA considered 2 alternatives, the proposed action discussed above and a No Action alternative under which no SCR systems would be installed. A No Action alternative would not enable TVA to meet State Implementation Plan (SIP) limits for NO<sub>x</sub> under section 110 of the Clean Air Act.

## Impacts Assessment

An interdisciplinary TVA team reviewed the potential direct and indirect effects of the proposed use of SCR systems at ALF for NO<sub>x</sub> control. From this review the following environmental issues were identified:

- Beneficial effects to air quality from reducing NO<sub>x</sub> emissions
- Contamination of coal combustion by-products with ammonia
- Contamination of chemical pond and ash pond with ammonia
- Wastewater impacts to surface water quality from ammonia in the chemical treatment pond and ash pond effluents
- Compliance with floodplain Executive Order 11988 for the West Ash Pond extension
- Public and worker safety issues related to the storage and handling of anhydrous ammonia
- Socioeconomic effects of the project related to increased jobs

These issues were the basis for the evaluations in the environmental assessment.

The proposed installation and operation of SCR systems will have beneficial impacts to regional air quality by reducing the NO<sub>x</sub> available in the atmosphere for use in ozone production, and thus locally and regionally reducing ground level ozone.

The impacts evaluation determined that there was a clear potential for contamination of combustion by-product (fly ash) and wastewater treatment ponds with ammonia compounds due to ammonia slip past the catalyst. Water discharged from the fly ash storage pond may contain ammonia sluiced to the pond with the fly ash. Water discharged from the chemical treatment pond may contain ammonia from air preheater washes and/or from containment of any accidental release of anhydrous ammonia from either the storage tanks or an unloading tank truck. Because ammonia is toxic to aquatic life, its discharge concentration must be controlled to avoid adverse impacts.

Prior to re-activation and expansion of the West Ash Pond, management of catalyst (Commitment 3 below) and water treatment system flows through the East Ash Pond would maintain discharge ammonia concentrations below levels necessary to safeguard water quality and to protect aquatic life. Following the return of the West Ash Pond to service, all fly ash would be sluiced to that pond and managed subject to the commitments below to ensure protection of water quality and aquatic life. To ensure that ammonia concentrations in the chemical treatment pond are below the maximum concentrations for protection of aquatic life, the discharge from the chemical treatment pond will be reconfigured, combined with condenser cooling water, and discharged away from McKellar Lake.

Fly ash generated at ALF is not marketed. Most ALF boiler slag (bottom ash) is used in manufacturing of roofing granule and as industrial abrasives. No impacts associated with bottom ash marketing, utilization or disposal are expected.

The proposed re-activation and expansion of the inactive West Ash Pond in order to better manage ammonia slip contaminating fly ash could involve some construction in the 100-year floodplain and would be subject to compliance with Executive Order 11988. Alternatives to expanding in the floodplain were evaluated and the determination made that there is no practicable alternative to the proposed project-related action because there is no land available on-site and off-site would be prohibitively expensive. The expansion of the West Ash Pond would not increase the incidence of flooding or flood damage potential, which fulfills the requirements of Executive Order 11988.

Ammonia is a toxic gas and therefore storage and handling of large quantities of anhydrous ammonia as proposed as part of the SCR systems poses a substantial potential hazard to plant workers and the public. The risk of this hazard was evaluated using methods and criteria consistent with 40 CFR Part 68—Chemical Accident Prevention Provisions. Accidental release scenarios for the EPA-defined worst case release and for alternate release scenarios were evaluated for the anhydrous ammonia storage tanks and for tanker trucks. For the Alternative Release scenarios, potentially affected populations were confined to employees on the plant site. For the worst case release scenario, off-site impacts were projected for a substantial area of the public. Further risk evaluation was conducted of events that could cause such a release. It was judged that only tornadoes and major earthquakes could cause a worst case release. The probability of a tornado (about one occurrence every 588 years) coincident with the assumed weather conditions causing poor dispersion of the ammonia gas was found to be  $2 \times 10^{-4}$  which was judged to be a minimal risk. Based on an evaluation of the earthquake potential, TVA committed to design the ammonia facility to be earthquake resistant, thus reducing risk to a minimal level.

The requirements under 40 CFR part 68 for emergency planning would help address the impacts of accidental releases from the ammonia facility. This will include development of emergency response plans coordinated with local agencies, procedures for system operation and maintenance, and worker training. Additionally, a water fogging system included in the project design will reduce the impacts of both worst case and alternative release scenarios.

The potential socioeconomic effects of the proposed action were evaluated and found to be minor. The proposed actions would be a minor physical addition to an expansive heavy industry facility having a substantial property buffer area. Environmental justice was evaluated. A disproportionately high percentage of minority and low-income population occurs in the plant vicinity. In general, operational impacts would be minor and not noticeable to residents of the surrounding area. In the event of a highly unlikely accidental release of ammonia, the area around the plant site that would be most affected has a much larger share of minorities and low-income persons than does Shelby County or the state as a whole. However, reduced  $\text{NO}_x$  from operation of the SCRs would also disproportionately benefit disadvantaged populations.

## **Mitigation**

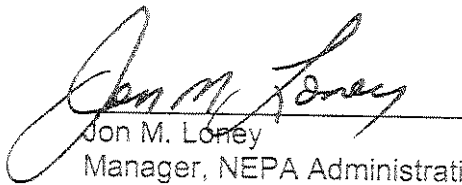
The following environmental commitments and mitigative measures were identified as necessary to ensure that environmental impacts are insignificant:

1. Compliance with 40 CFR 68 prior to filling of the ammonia storage tanks or transport onsite of ammonia in a quantity exceeding 10,000 lb.

2. Adherence to substantive provisions of 29 CFR 1910.111 (Storage and Handling of Anhydrous Ammonia) and 29 CFR 1910.119 (Process Safety Management of Highly Hazardous Chemicals) including those for proper equipment design, hazard assessment, operating procedures, employee training and emergency planning.
3. Until the West Ash Pond is brought back into service, the ammonia slip would be controlled by catalyst management, such that ammonia discharged from the East Ash Pond does not exceed 0.85 mg NH<sub>3</sub>-N/L. Upon re-activation of the West Ash Pond, the SCR systems will not be routinely operated with an ammonia slip exceeding 2 ppm. Brief system process excursions or process upsets would be an exception to these interim and final limits.
4. Seismic hazards to the ammonia facilities will be addressed by compliance with the seismic provisions of the 1997 version of the International Conference of Building Officials (ICBO) Uniform Building Code (UBC).
5. Use of appropriate operational controls and treatment measures to meet whole effluent toxicity (WET) and effluent discharge limits in the NPDES permit. The types of operational controls and treatment measures include:
  - Re-activation and expansion of the West Ash Pond to receive fly ash with the pond discharge configured to combine with condenser cooling water and to discharge away from McKellar Lake.
  - Commitment 3 above and pH control of discharges from the ash and chemical treatment ponds to meet NPDES permit requirements; and
  - Reconfiguration of the discharge from the chemical treatment pond (DSN006) to combine with condenser cooling water and to discharge away from McKellar Lake.
6. In order to contain and control an accidental spill of ammonia, the area around the ammonia unloading and storage area will be configured to drain to the existing, immediately-adjacent, chemical treatment pond which has an impermeable liner.

## Conclusion and Finding

Environmental Policy and Planning's NEPA Administration staff reviewed the Allen Fossil Plant Units 1, 2, and 3 Selective Catalytic Reduction Systems for Nitrogen Oxide Control EA and determined that the potential environmental consequences of TVA's proposed action to construct and operate the SCR systems have been addressed and that the proposed action is not a major federal action significantly affecting the quality of the environment. Accordingly, an environmental impact statement is not required.

  
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Date